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20 December 1991

Mr. Jim Koffer  
Rocky Flats, Inc.  
P.O. Box 464  
Golden, Colorado 80402-0464

Subject: Assessment of Slope Stability Impact of  
"Key Trench" on French Drain Construction  
WESTON Work Order No. 2029-33-09

Dear Mr. Koffer:

At your request WESTON has evaluated the effect of the "key trench" on overall slope stability of the French Drain excavation. This evaluation was performed using existing geotechnical data presented in WESTON's report entitled "French Drain Geotechnical Investigation" 05 October 1990. The assessment assumes a homogenous rock or soil mass without significant discontinuities.

The geotechnical investigation determined that: 1) The density of the alluvial/colluvial material averages 124 pound per cubic foot (pcf); and, 2) The cohesion (as evaluated in direct shear testing ASTM D-3080) or resistance to movement of this material was 1,622 pounds per square foot (psf). The attached drawing (Drawing 1) displays the relationship of the "key trench" to the recommended excavation slope. To determine the effect of the "key trench" on the overall slope stability, the force of the rock mass imparted to a theoretical surface must be determined. This is done by calculating the weight of the rock mass and multiplying this value by the cosine of the opposite angle of the slope. This force is then compared to the cohesion developed along the theoretical surface. If the cohesion value is greater than the force, the rock mass is stable.

The attach figure (Figure 1) displays safety factors for varying "key trench" depths. The safety factor is determined by dividing the cohesion value by the force imparted by the rock mass. Values of safety factors greater than 1.0 indicate stability. However, to provide appropriate worker protection, safety factors of 1.2 and greater are recommended. Figure 1 indicates that a safety factor of 10.17 occurs for the typical 2 foot deep "key trench" on the French Drain excavation.

ADMIN RECORD



Mr. Jim Koffer

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It is therefore WESTON's opinion that the typical "key trench" does not result in significant slope instability of the French Drain excavation in homogenous rock or soil without discontinuities.

Should you have any further questions, please do not hesitate to contact me.

Sincerely,

ROY F. WESTON, INC.

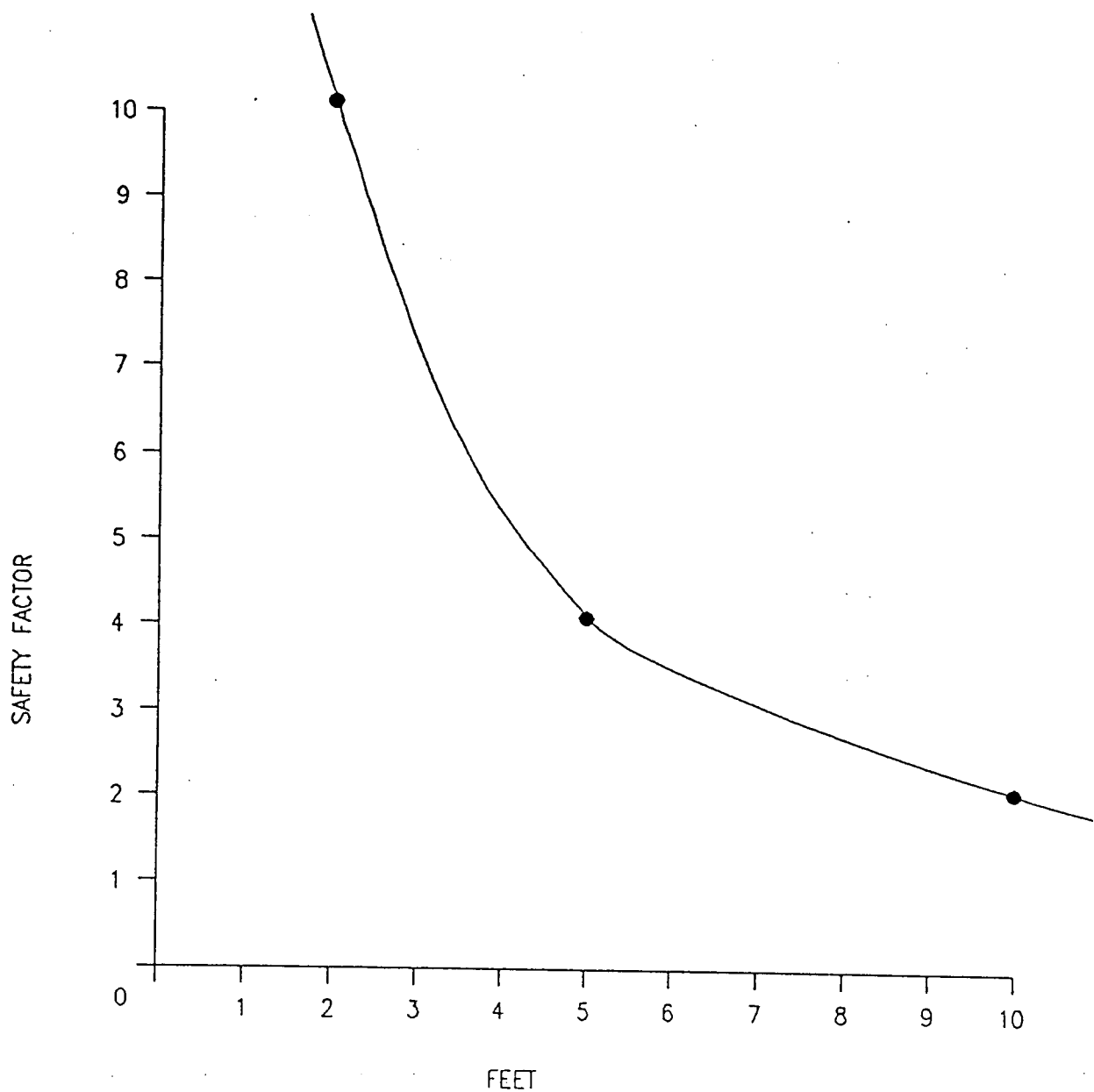
A handwritten signature in black ink, appearing to read "GDS", followed by a long horizontal line extending to the right.

Greg D. Sherman, P.G.  
Project Manager

Attachments

GDS/kjm

cc: Mark Burmeister  
Mark Buddy  
2029-33-09

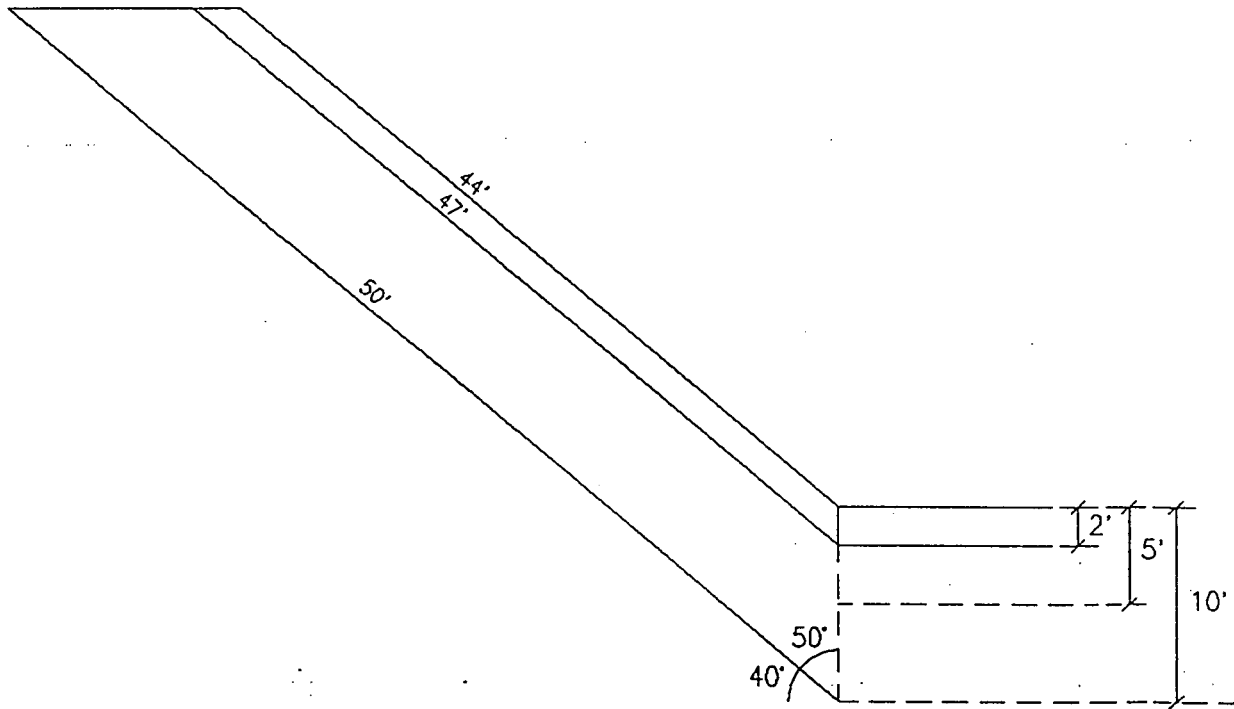


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FIGURE 1



R33167.CW-122091



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DRAWING 1